



Australian Government

National
Landcare
Program



Ground cover monitoring

An online tool for Australian regions

Soil is a major national asset. The National Landcare Program (NLP) provides funds to improve soil condition by encouraging farmers to adopt practices such as better management of ground cover (Figure 1). This reduces loss of soil, nutrients and carbon through wind and hillslope erosion, while improving air and water quality for the community.

Project funding is made available on the basis that over time, successful investments will be able to demonstrate improvements in condition beyond the project boundaries — for example, on similar landscapes within a region. Ground cover monitoring and reporting using the RaPP Map tool will help answer the question – is the program having an impact on the condition of the soil resource?

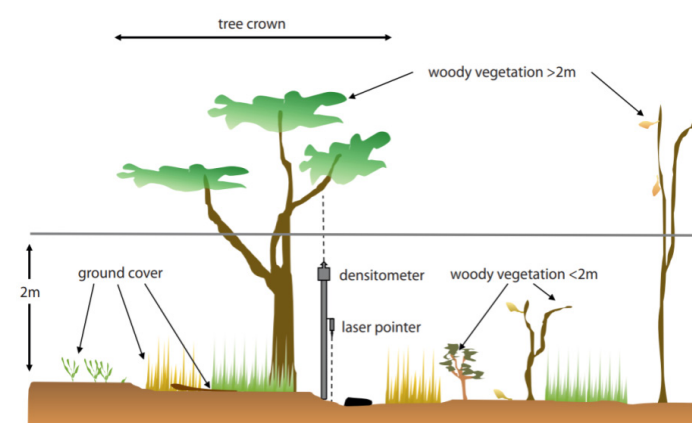
About RaPP Map

RaPP Map is the spatial data platform for the Rangeland and Pasture Productivity activity, part of the Group on Earth Observations Global Agricultural Monitoring (GEOGLAM) initiative. This online tool gives access to a time-series (2001–present) of monthly satellite data showing the levels and trends of total vegetation cover, and the different fractions of cover (green, dead and bare ground - Figure 2) for global drylands and rangelands. It also reports rainfall.

- National Landcare Program (NLP) funding is provided to regional and other organisations to encourage farmers to improve soil management.
- An online tool which provides easy access to monthly satellite data is now available to track how ground cover is responding to climate and management.
- The tool will help organisations to demonstrate over time how their investment in projects to reduce soil lost through wind or hillslope erosion are contributing to improving soil condition across the region.
- Organisations receiving NLP funds to reduce soil lost through wind or hillslope erosion will need to attend training to develop their reporting methods. Others may wish to participate.

FIGURE 1 Grazing management effects on cover levels

Photo John Leys

FIGURE 2 Vegetation cover classes

Source: Muir et al. 2011

Using RaPP Map for ground cover reporting in Australia

The online tool (<https://map.geo-rapp.org/#australia>) has been developed to help Natural Resource Management (NRM) organisations and the Australian Government understand and report on ground cover, and how changes in its management reduce hillslope and wind erosion risk. The tool delivers total vegetation cover maps as a time-series for Australia, along with information (deciles and anomalies) needed to compare changes in cover over time.

The MODIS satellite derived layers in the tool provide coarse spatial resolution (500 m pixels) information, which are updated monthly. Layers from the Landsat satellite provide high spatial resolution (30 m pixels) information, but are only updated seasonally, and can only be viewed as maps at the time of publication. Landsat data is good for property scale (down to 100 m by 100 m) analysis over long time periods at seasonal time steps. MODIS data is good for monthly regional scale (down to 2 km by 2 km) and near real time analysis, reporting and tactical decision making.

RaPP Map will help NRM organisations to:

- view the spatial distribution of total vegetation cover in their region. Where are the low cover areas? This can be done monthly with 500 m or seasonally with 30 m resolution data
- understand how cover is changing in space and time
- understand how this month's cover compares with average cover
- see how the cover level ranks (as a decile) to equivalent months in the 18 year record
- query the data and get an average total, green, dead or bare ground cover and rainfall for a given polygon (e.g. NRM region) over the last 18 years
- explore results onscreen and download them for further analysis
- set and report against ground cover targets monthly, with training.

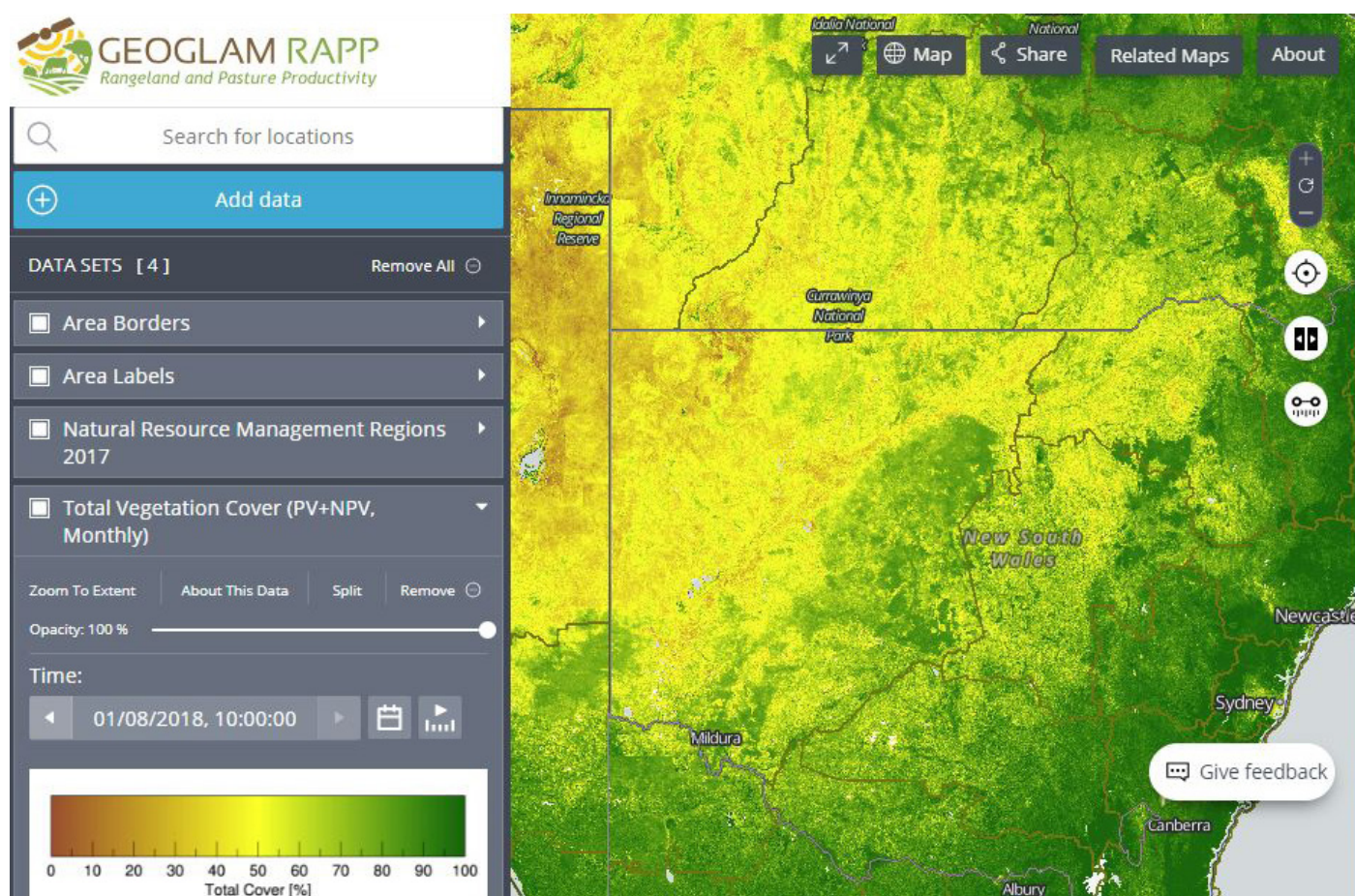
How does RaPP Map relate to and work with other tools using remote sensing?

The tool complements other Australian initiatives including VegMachine© (vegmachine.net) and FarmMap4D Spatial Hub (farmmap4d.com.au), which deliver higher spatial resolution (30 m) seasonal compilations of ground cover data.

RaPP Map is best suited to regular reporting of regional scale changes in total vegetation cover.

VegMachine© provides access to Landsat and Sentinel fractional cover data products. Users can select a region of interest and retrieve time-series data, or compare cover average total vegetation values for two regions over time. It is best suited for seasonal reporting over long (30 year) time frames at property level.

FarmMap4D is a commercial service available by subscription, aimed at property level management. It uses the same web services as VegMachine© to show time-series data from the Landsat fractional cover product, and provides property managers with a tool to assess, monitor and manage property infrastructure.

FIGURE 3 Total vegetation cover for natural resource management regions in inland southern Australia, August 2018

What training will be available to the NRM organisations and when?

Training is planned for the regions between March and May 2019. While RaPP is a simple web interface designed for users without geographic information system or remote sensing experience, the best value is obtained after some training. Using the RaPP tool for regional reporting requires:

- understanding data available for project area and regional reporting, and how to access it
- exploring the data products (see example at Figure 3) to get the answers you need about ground cover
- accessing the time series data for a region to develop benchmarks and targets
- deciding how to report to meet the requirements of Landcare MERI plans.

Does it need to be in our organisation's MERI Plan?

Organisations with NLP identified priorities for managing wind and hillslope erosion are encouraged to use the tool. Organisations funded under Outcome 5 for wind or hillslope erosion work, or Outcome 6 projects aimed at improving grazing or cropping land management (except soil acidification), should identify RaPP Map and any other tools proposed for monitoring project areas in their MERI plans.

Training will include consideration of how best to report on changes at project and regional scales. A report "Monitoring ground cover: an online tool for Australian regions" (including a user guide) will be available at the end of October 2018 at agriculture.gov.au.

Acknowledgements

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